

Accelerating open innovation in wind energy: the WeDoWind EAWE Test Turbines Committee Space

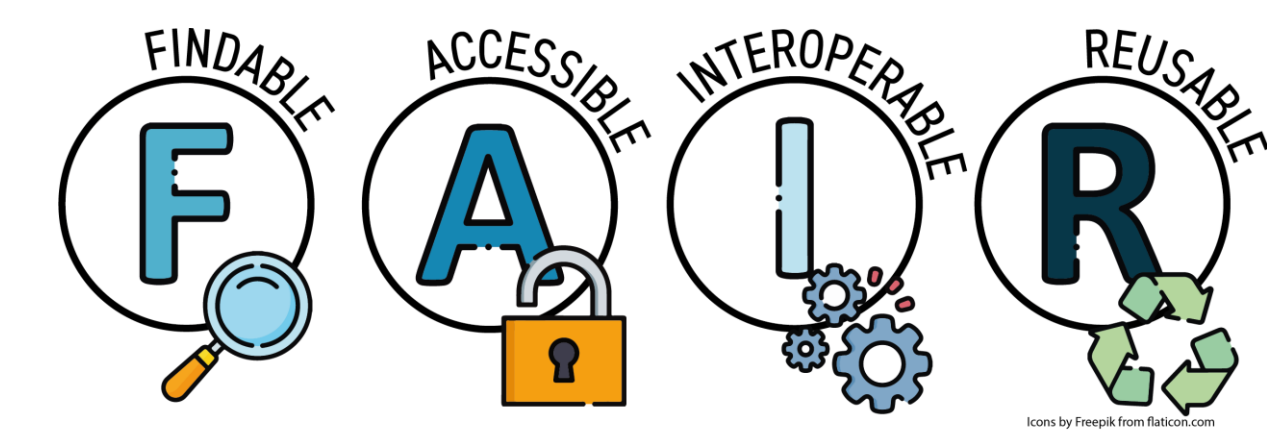
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Open, FAIR data and community-driven digital platforms like WeDoWind enable collaborative innovation, accelerating digitalisation and value creation in wind energy

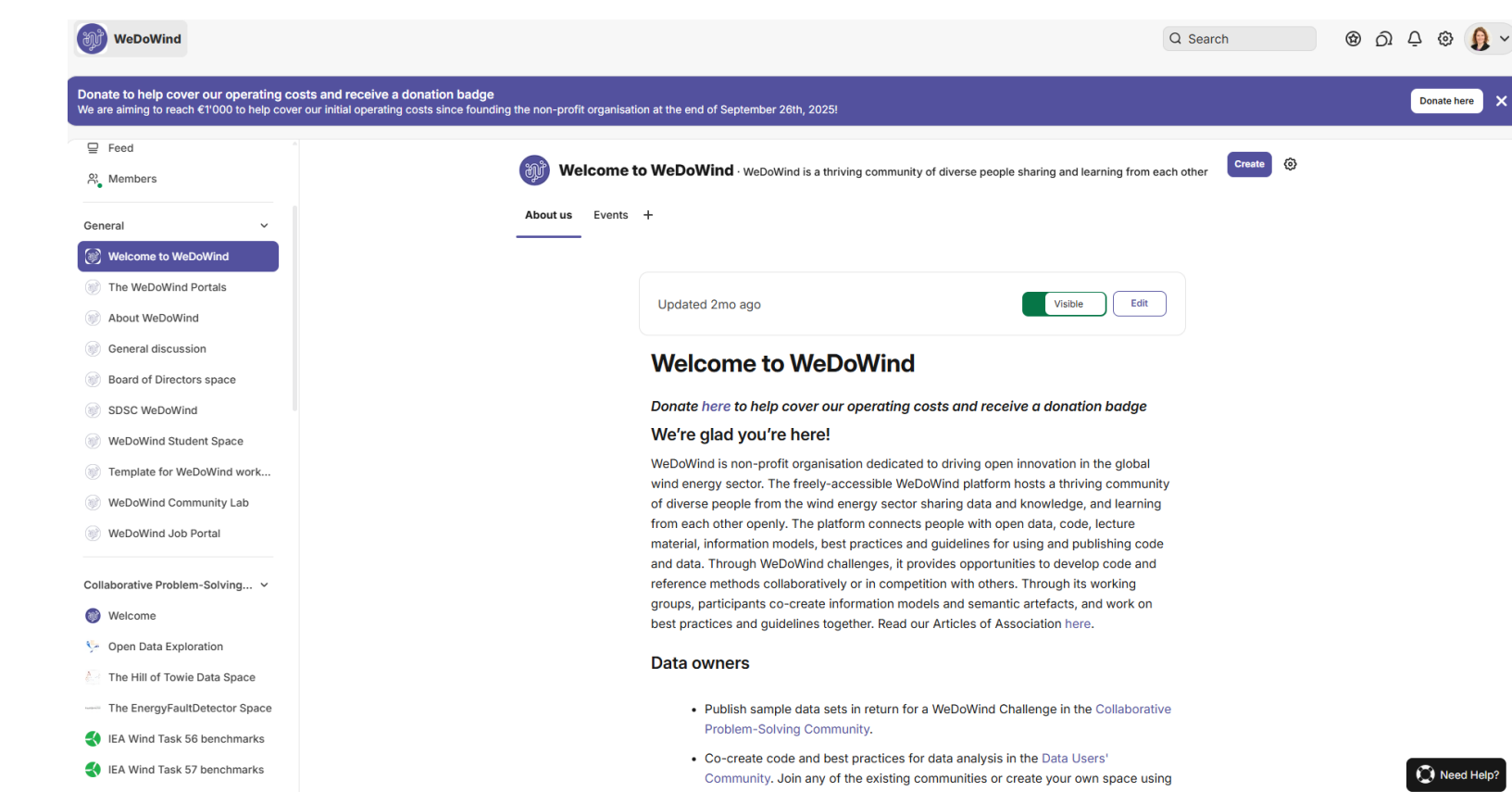
Motivation:

- Digitalisation and AI are transforming wind energy, increasing the need for interoperability and data sharing
- Community-adopted information models make data FAIR and AI-ready through shared semantics and vocabularies
- Open innovation platforms enable global collaboration
- WeDoWind connects four communities: information modelling, collaborative problem-solving, open data & code, and data users
- Previous WeDoWind challenges show reduced costs and increased value through open collaboration

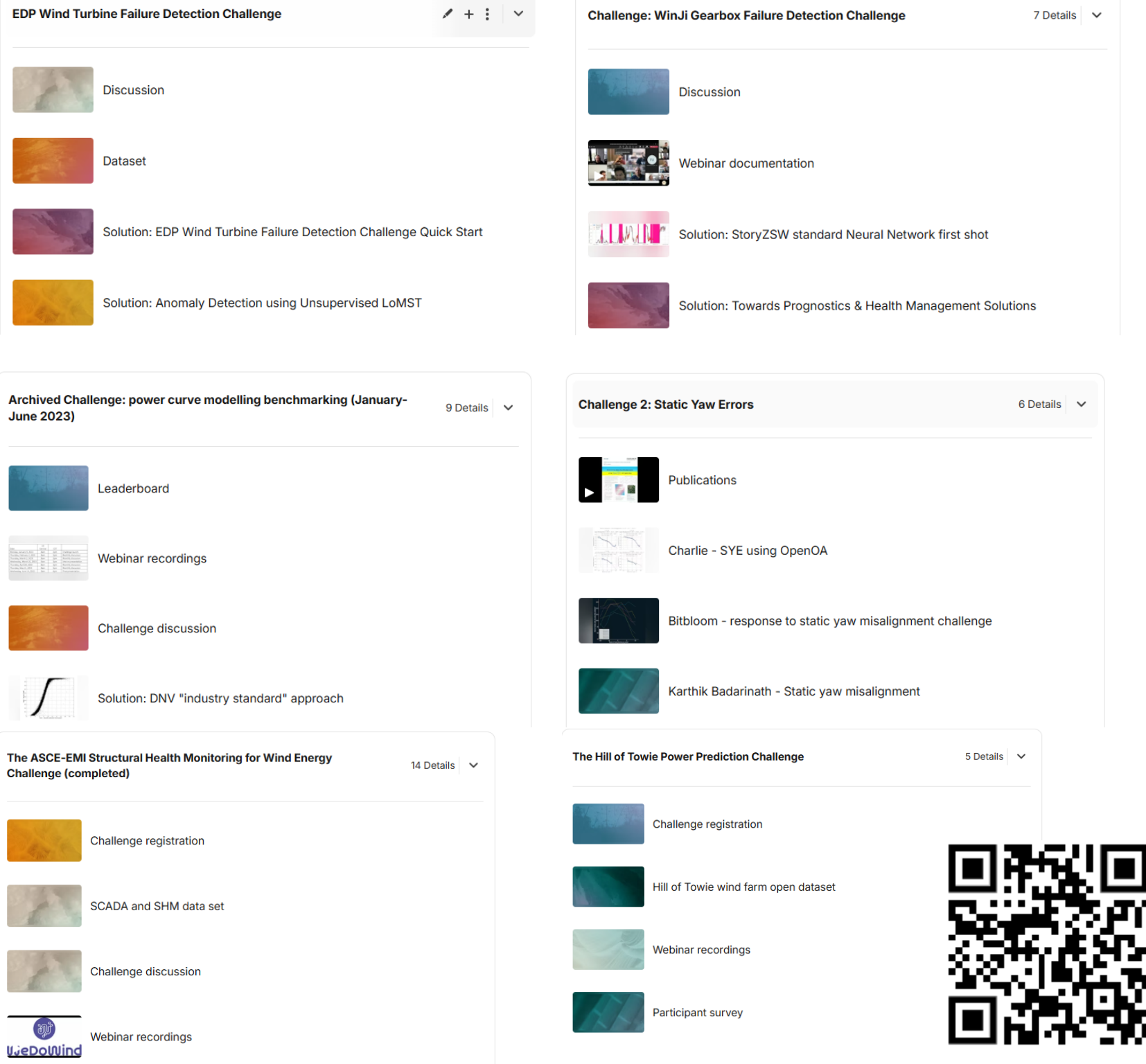


About WeDoWind:

- A digital platform that brings people and solutions together with data to unlock its full value

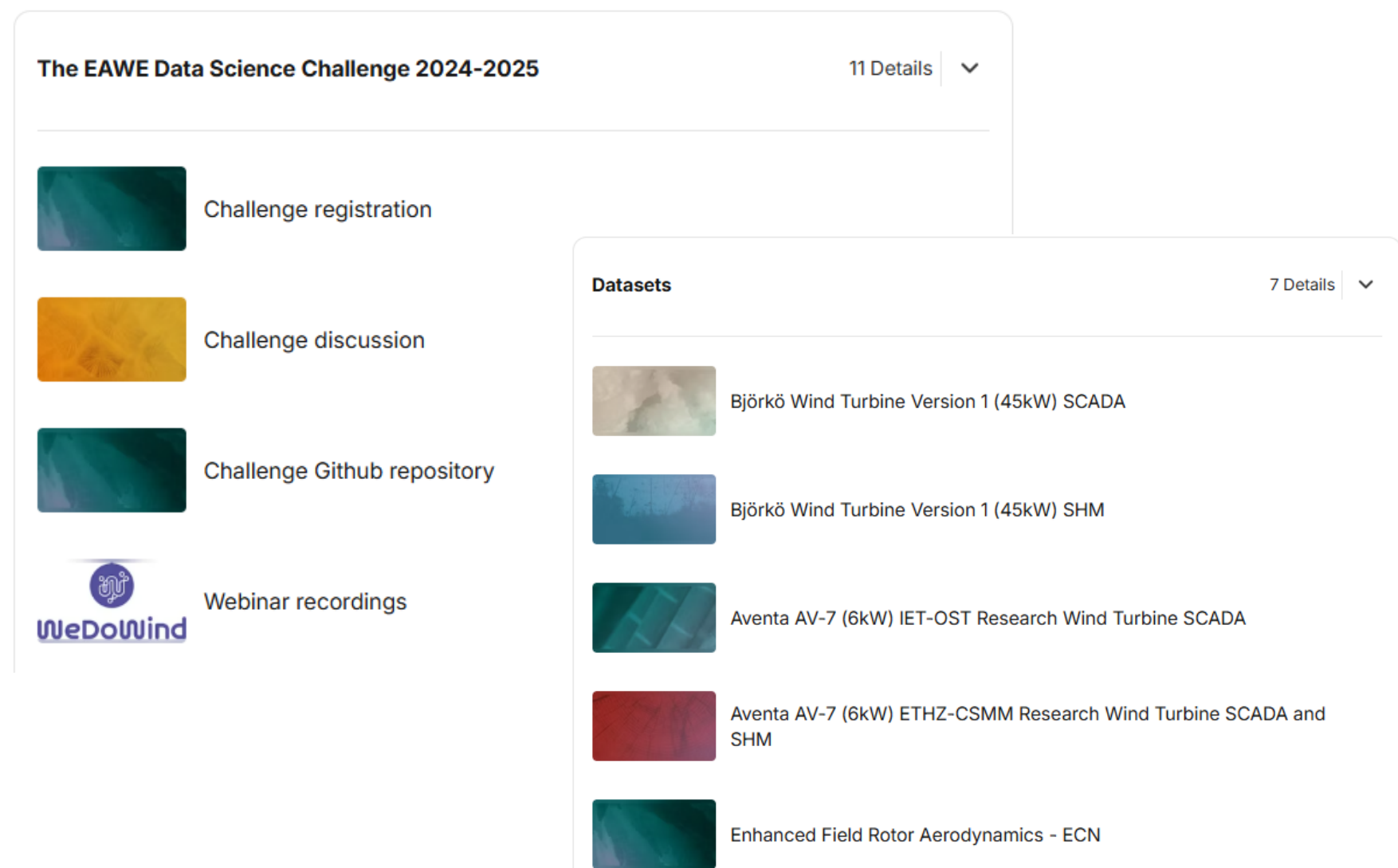


Previous challenges:



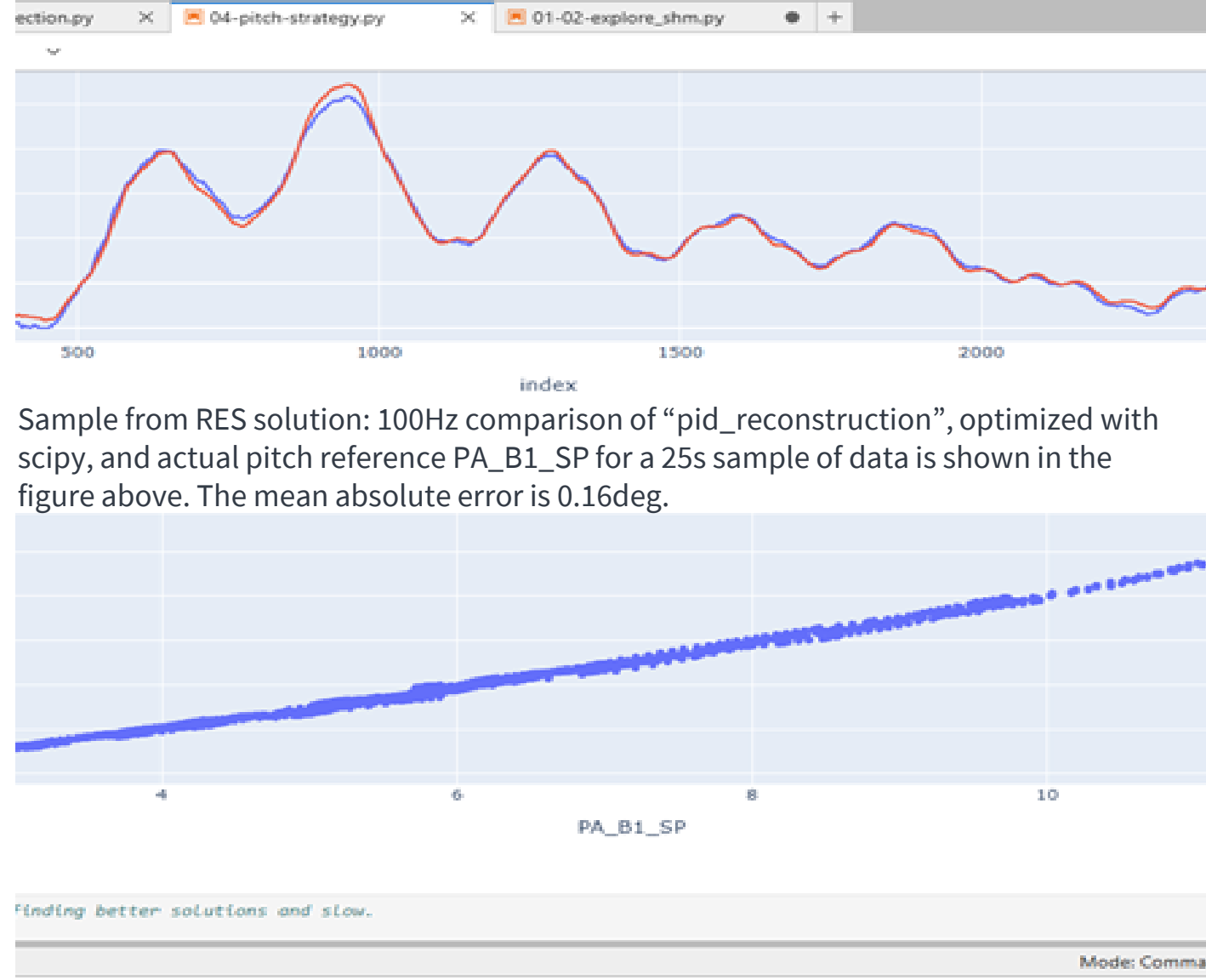
This work:

- The EAWE Test Turbines Committee Space was created and the EAWE Data Science Challenge 2024-2025 was run
- Included new open datasets published on Zenodo and made as FAIR as possible
- Goal: identify turbine controller settings from high-frequency operational data



Results for the winning method by RES:

- High-frequency data was pre-processed into Parquet format and analysed with polars for optimising for speed and handling large volumes efficiently
- Torque lookup values were identified using a Histogram-based Gradient Boosting Tree
- A robust pitch control model was developed by combining subject matter expertise with model optimisation techniques (figure below)



Conclusions:

- Results demonstrated feasibility and methodological diversity
- Collaborative digital platforms can accelerate open innovation in wind energy
- FAIR datasets and reusable code significantly lower barriers to data use
- Open challenges stimulate methodological innovation and knowledge exchange